WHAT IS CLAIMED IS:

1. A positioning-controlling apparatus comprising a servo motor, a servo driver for controlling the driving of the servo motor, a rotary encoder for detecting the rotation amount of the servo motor, a moving mechanism driven by the rotation of the servo motor, and a linear encoder for detecting the moving amount of the moving mechanism,

wherein said servo driver detects, from the rotary encoder, a CS phase necessary for driving the servo motor and generates a current instruction with rectangular waveform pulses which are obtained from the CS phase from the rotary encoder until the time when the rotary encoder detects a Z phase or the linear encoder detects a Z phase, and after the rotary encoder detects the Z phase or the linear encoder detects the Z phase, generates a current instruction with sine waveform pulses based on the Z phase detected by the rotary encoder, thereby switching the driving mode of the servo motor, and wherein at the time of turning on a power supply, said servo driver returns a subject which is moved by the moving mechanism, to an origin which is the position of the Z phase detected by the linear encoder, and then, moves the subject to a required position and stops it there for positioning,

characterized in that the rotary encoder detects the Z

phase previously in the operation of returning the subject to the origin.

2. The positioning-controlling apparatus according to claim 1, wherein said subject is completely returned to the origin under the condition that, while said subject is being moved by the moving mechanism to return to the origin, an origin sensor first detects that said subject is being within a detectable region of the origin sensor, and the rotary encoder detects the Z phase and the linear encoder detects the Z phase in this order within said detectable region.

3. The positioning-controlling apparatus according to claim 1, wherein said subject is not completely returned to the origin and continued to be moved under the condition that, while said subject is being moved by the moving mechanism to return to the origin, the origin sensor first detects that said subject is being within the detectable region of the origin sensor, and the linear encoder detects the Z phase before the rotary encoder detects the Z phase within said detectable region; and said subject is completely returned to the origin under the condition that said subject is continued to be moved to once go out of said detectable region and then moved to the reverse

direction to again enter said detectable region, so that the rotary encoder detects the Z phase, and then the linear encoder detect the Z phase within said detectable region.

4. The positioning-controlling apparatus according to claim 1, wherein, when said subject is moved by the moving mechanism to be returned to the origin, the subject's moving direction for returning to the origin is predetermined, and wherein the origin sensor, the Z phase to be detected by the rotary encoder and the Z phase to be detected by the linear encoder are adjusted so that the origin sensor can first detect that said subject is being within said detectable region, then the rotary encoder can detect the Z phase, and then the linear encoder can detect the Z phase, while said subject is moved along the predetermined direction.

5. The positioning-controlling apparatus according to claim 4, wherein in case one end of the subject's movable region coincides with one end of said detectable region, the Z phase to be detected by the linear encoder and the Z phase to be detected by the rotary encoder are arranged so that first the rotary encoder detects the Z phase and then the linear encoder detects the Z phase while said subject is moved toward said one end of said

detectable region from the other end thereof.

6. The positioning-controlling apparatus according to claim 5, wherein, when the position of said subject at the start of the subject's origin returning operation is outside of said detectable region, said subject is moved to a predetermined direction specified as the moving direction for returning the origin, so as to be returned to the origin.

7. The positioning-controlling apparatus according to claim 5, wherein, when the position of said subject at the start of the subject's origin returning operation is within said detectable region, said subject is moved to a direction reverse to a predetermined direction specified as the moving direction for returning the origin, so as to once go out of said detectable region, and then moved to the reverse direction of said predetermined direction, so as to be returned to the origin.

8. The positioning-controlling apparatus according to claim 1, wherein an offset amount and an offset direction, which are the distance and the moving direction from the position where the rotary encoder detects the Z phase to the position where the linear encoder detects the

Z phase are predetermined, and said servo driver switches the driving mode according to the current instruction with rectangular waveform pulses to the driving mode according to the current instruction with sine waveform pulses, when said subject is moved to the offset direction by the offset amount from the position where the rotary encoder detects the Z phase.

9. Part-mounting equipment comprising

a circuit-formed material-holding device for carrying and holding a circuit-formed material,

a part-supplying unit for supplying parts,

a mounting head capable of taking a part out of the part-supplying unit and mounting the part on the circuit-formed material,

a robot for carrying the mounting head, and

a controller for controlling the circuit-formed material-holding device, the part-supplying unit, the mounting head and the robot,

whereby the part taken out of the part-supplying unit by the mounting head is mounted on a predetermined mounting position of the circuit-formed material,

characterized in that either or both of the robot and the circuit-formed material-holding device comprise(s) the positioning-controlling apparatus according to claims 1, in

order to accurately position the part at the predetermined mounting position of the circuit-formed material.

10. The part-mounting equipment according to claim 9, wherein said robot or said circuit-formed material-holding device comprises a multi-axial driving unit for synchronous operation using a plurality of servo motors, so as to carry the mounting head or the circuit-formed material in a predetermined direction.

11. A positioning-controlling method comprising the steps of

driving a servo motor, which is a driving source for moving a subject, according to a current instruction with rectangular waveform pulses obtained from a CS phase detected by a rotary encoder until the time when the rotary encoder which detects the rotation amount of the servo motor detects a Z phase or the linear encoder detects a Z phase;

switching the driving mode of the servo motor to a driving mode according to a current instruction with sine waveform pulses based on the Z phase after the rotary encoder detects the Z phase or the linear encoder detects the Z phase;

once returning said subject to the origin which is the

position of the Z phase detected by the linear encoder which detects the moving amount of said subject, and

moving said subject to a required position so as to position said subject,

characterized in that a condition that the rotary encoder should previously detect the Z phase is added to the condition of completing the subject's origin returning operation.

12. The positioning-controlling method according to claim 11, wherein, in the subject's origin returning operation, the subject's moving direction for returning to the origin is predetermined, and wherein the origin sensor, the Z phase to be detected by the rotary encoder and the Z phase to be detected by the linear encoder are arranged so that the origin sensor first detects that said subject is being within said detectable region, and the rotary encoder detects the Z phase and the linear encoder detects the Z phase in this order, while said subject is being moved to said predetermined direction.

13. A part-mounting method comprising the steps of taking a part out of the part-supplying unit, carrying the part to a mounting position of a circuit-formed material which is regulated and held, positioning the part at the

mounting position, and mounting the part on the mounting position,

characterized in that the positioning-controlling method according to claim 11 is employed for positioning either or both of a mounting head for holding and carrying the part and a holding device for regulating and holding the circuit-formed material, in order to accurately position said part at the predetermined mounting position of the circuit-formed material.